

Cover page

Official Title of the study: Brief Mindfulness-Based Family Psychoeducation Intervention for Chinese Students with Early Psychosis: A Mixed Methods Study

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BACKGROUND RESEARCH

Severe Mental Illness (SMI), Early psychosis (EP), and its impact on student's development

Serious Mental Illness (SMI), traditionally named psychosis, is defined as a mental, behavioural, or emotional disorder that has been medically diagnosed for at least one year. SMI usually results in serious functional impairment, which substantially interferes with, or limits one or more major life activities and functions in social, family, and vocational/educational contexts (Lefley, 2009). The number of adults with SMI represents 4.1 % of the population in United States (*Center for Behavioral Health Statistics & Quality*, 2015). In Hong Kong, the lifetime prevalence of SMI was 2.5% (Chang *et al.*, in press). The term early psychosis (EP) is typically used for young people before and after their first identified episode.

SMI has a marked increase in prevalence between ages 15 to 17. The majority of SMI manifests in the age group 20 to 30, with a median of age for first psychotic episode of 22 (Kessler *et al.*, 2007). Young people with SMI often have delimited social networks and experience much social isolation (Bebbington & Kuipers, 2008). A study reported at the first contact to EP service, over 40% of these young people were not in school or unemployed (Marwaha *et al.*, 2004). A meta-analysis reported that 34.5% of the individuals with psychosis perpetrated violent behaviours before admission to psychiatric services (Large & Nielssen, 2011). Recent studies in Hong Kong found that 42% of the patients with first episode psychosis reported suicidal ideation, and 9.4% committed violent behaviours (Chang *et al.*, 2014; Chang *et al.*, 2015). Students with EP experience a high-risk period and it causes many family caregivers under immense strain and anxiety.

Family caregivers of young people with EP

Family caregiving is defined as the behaviour of one's commitment to the welfare of another family member, and the provision of voluntary care to meet their physical, psychological and developmental needs (Revenson *et al.*, 2016). Family caregivers often take up their roles without any formal preparation, knowledge, resources or skills, and frequently experience many psychological burdens. Such burdens can be assessed in empirical terms, referring to the consequences on the family's physical and psychological well-being due to these symptoms and behaviours. The management of family member's bizarre behaviors, fluctuating emotions, suicidal ideations, and being unemployed after onset of EP became the major sources of caregiving burden (Wong *et al.*, 2012). Burden can also be perceived in subjective terms, involving the appraisal of individual caregivers, relating to their difficult emotions arising from the suffering of the family member, such as loss, grief, and the negative perceptions from relatives and neighborhood (Lefley, 2009). Studies have shown that over one-third of the caregivers experienced emotional distress, such as depression (Chen *et al.*, 2016).

Some earlier studies of caregiving have focused on family expressed emotions (EEs), a robust predictor of relapses and overall outcome of SMI, including number of relapses, hospitalization, and symptom severity (Hooley, 2007; Weintraub *et al.*, 2015). High EEs are defined as criticism, hostility, and over-involvement (Brown, Birley & Wing, 1972), and are considered as a reciprocal process in family interactions that are developed and increased after illness onset, particularly in the first five years (Hooley, 2007). Reduction of caregiving burden has been associated with an acceptance of the patient's behaviours, illness course and caregiver's own social functioning (Magliano *et al.*, 2000).

However, other studies of EEs targeted on EP have suggested a more complicated picture. A recent review of higher EE concluded that higher levels of criticism predicted positive symptoms of SMI, but no association was found in negative symptoms of EE, including criticism and emotional over-involvement (Cechnicki *et al.*, 2012). Further, avoiding coping, negative appraisals of the impact of illness, and perceived losses were associated more frequently with family EE. This implies that mindfulness can promote more caregiver acceptance of their afflicted youth that in turn, will help to reduce EE and caregiver burden (Jansen, Gleeson, & Cotton, 2014). Among families facing EP, over-involvement is often a normal process, as young people have not fully developed their own self-care abilities, and the boundaries between positive concern and family over-involvement is blurred and unclear (McNab & Linszen, 2009). Higher level of EE was also more likely to be found in families from non-Western cultures, such as India, Japan, and China (Bhugra & McKenzie, 2010). It may be the cultural norm in these countries, as it co-exists with positive factors such as family connectedness and strong family ties. A study of African-American patients found that higher

level of EE has been associated with better overall outcomes, suggesting the association between EE and outcomes is less straight forward in non-Western cultural groups (Gurak & Mamani, 2017).

Psychoeducation for family caregivers

Family psychoeducation (FPE) is a core component in the treatment for SMI or EP, as recommended by The Schizophrenia Patient Outcomes Research Team (PORT) and National Institute for Health and Care Excellence (NICE) (Dixon *et al.*, 2010; NICE, 2015). Many FPE programmes apply cognitive behavioural models with an emphasis on family dysfunction, characterized by high EEs, and usually involve the teaching of practical knowledge and skills required to manage EP (McFarlane, 2016, Sellwood *et al.*, 2007). Other programme components include empathic understanding, social supports, normalization of reactions, resource information, exchange of coping strategies, and installation of hope (Lefley, 2009). The efficacy of FPE is still inconclusive. A meta-analysis reported FPE largely benefited patients and their one-year relapse rate reduced from 41 to 53% for the study control group, to 6 to 12% for a treatment group. However, the improvements for caregivers were limited (Magliano & Fiorillo, 2007; Yesufu-Udechuku *et al.*, 2015). Findings of FPE in Hong Kong studies are also mixed. A study of a FPE programme reported selected improvements in the functioning of patients and families, caregiving burden, and fewer relapses (Chien & Wong, 2007). Another study reported improvements of patients and caregivers only at posttest. Effects at 1-year follow-up were sustained for caregivers, but not for patients (Chan *et al.*, 2009). However, participants from a peer-led support group reported stronger improvements in functioning of both patients and caregivers, compared with FPE (Chien & Thompson, 2013). However, EEs and family factors were not studied as an outcome in these studies, and all FPE participants were mixed groups, rather than specifically caregivers of young people with EP. As a result, research gaps in FPE programmes warrant attention. To improve the effectiveness of FPE, first, the design of a FPE should be more theory-driven. The assumption about higher EEs and their role in preventing EP and SMI relapses in Western studies have faced challenges, as many high burden families have not showed higher EEs (Lefley, 2009). A recent review study concluded that it remains unclear how and why FPE works (Gracio, Goncalves-Pereira & Leff, 2016). Second, intervention for FPE should be simple, practical, effective and sustainable. Previous programme designs were relatively long and unstructured. Some studies examined a 48-session programme, which created difficulties for fidelity and implementation, and families were burdened to participate in such intensive programme (Glynn, 2012). Advance practice knowledge about how to enhance the caregiver's role functioning is deemed to be useful. Third, developmental needs and cultural issues for EP in Chinese families should be included as a guiding and contributive theoretical model (McGorry, Allott & Kackson, 2009). The management of young people with EP is beyond the comprehension of most families, and strengthening resilience for understanding, managing, and promoting positive caregiving experiences may be equally important, in addition to reduction to reducing caregiver burden (Jansen *et al.*, 2014).

Mindfulness-based intervention and its application in families

Mindfulness-based interventions have been widely adopted as an evidence-based approach in supporting people with chronic medical conditions (Bohlmeijer *et al.*, 2010). Kabat-Zinn (2013) defined mindfulness as paying attention non-judgmentally, to the present moment. Mindfulness can improve one's attention, promote tolerance to unpleasant sensations, and feelings, and can facilitate cognitive changes. It can strengthen a participant's stress coping, by the integration of programmed mindfulness exercises with combined illness specific psychoeducation (Kabat-Zinn, 2013; Segal, Teasdale & Williams, 2013). In mindfulness-based programmes, instructors provide guided training to mindfulness exercises, including body scan, stretching, and mindful sitting. An inquiry into participant needs is followed by an exploration of their personal experiences. New insights and understandings about the participants' reactions to stress will be addressed. In contrast to most FPE programmes, instructors do not offer answers or solutions for problem-solving and participants learn to acknowledge and develop their own capabilities to deal with their life challenges (Segal, Williams, & Teasdale, 2013).

Some studies have applied mindfulness-based interventions to parents or caregivers with positive outcomes, despite their weak research designs, heterogeneous participants, small sample sizes, and/or the lack of a control group. Bögels and colleagues (2014) recruited 86

parents of children with mixed psychiatric diagnoses for a non-randomized clinical trial of a mindfulness programme. In this study, improvements were found in mental health symptoms of both children and parents, and parental stress. Intervention for caregivers of children with developmental disabilities are growing, and positive changes in perceived stress and depressive symptoms of caregivers have also been found (e.g. Dykens et al., 2014).

To the knowledge of PI, there is no published randomized controlled study on application of mindfulness specifically for caregivers of young people with EP around the world. Thus, more studies targets to apply mindfulness to Chinese families are recommended to assist this knowledge building endeavour.

Hypotheses of the study

Based on the literature, two hypotheses have been proposed for this study: i) caregivers who participate in a MBFPE will experience less perceived stress, less depressive symptoms, more positive caregiving experiences, higher levels of mindfulness, and higher level of non-attachment than participants in the FPE. ii) young people with EP will report less psychiatric symptoms, higher level of recovery, and lower EEs, after their caregivers' participation in MBFPE, compared to the control group.

RESEARCH PLAN AND METHODOLOGY

Study design

This study uses a mixed methods design embedded in a multi-site, randomized control trial. The effects of this intervention will be tested using a two-arm randomized controlled trial, comparing the MBFPE (Arm 1), to an ordinary FPE (Arm 2). Assessments will be made before (T1), and after intervention (T2), and at the 12-month follow-up (T3). The programme effects will be tested using both between-subject (comparison of the two arms) and within-subject (comparison of measures at T1, T2, and T3).

Refinement of design from a pilot study. A pilot study was conducted in mid-2017. 36 caregivers were recruited in a non-randomized controlled trial. Compared with caregivers who received standard care, participants from MBFPE showed significant or marginally significant more improvements in caregiver perceived strain, ($F[34] = 2.72, p = .11$), compassion for the child (one component in interpersonal mindfulness) ($F[34]=4.56, p <.05$), positive caregiving experience ($F[34] = 3.56, p = .07$), and non-attachment ($F[34]=3.41, p = .07$). Follow-up meetings with social workers from a collaborating NGO, and feedback collected from participants were used to refine the MBFPE content and the mixed method design.

Sample size estimation. Since no similar study of the same kind has been conducted, the sample size calculation is based on a study of a mindfulness-based intervention for parents of developmental disabilities, in which an effect size of 0.65 in stress (Lo, Chan *et al.*, in press), with an estimation of an effect size of 0.15 for Arm 2. For a two-tailed α error of 5%, an 80% power, and a test of two independent groups, the required sample size will be 128 participants for two arms (Cohen, 1988). We further adjust the sample size based on an estimation of drop-out rate and intra-class correlation. An estimation of a drop-out rate of 15% is based on two local studies of mindfulness-based intervention (Hou *et al.*, 2014; Lo *et al.*, 2015). Besides, an estimation of intra-class correlations of 0.07 is based on PI's two recent mindfulness multi-site studies ranged from 0 to 0.07 and related studies in Western studies (Adams et al., 2004; Lo *et al.*, in press; Lo *et al.*, under review), and 300 caregivers will be recruited for this study.

Recruitment of participants. The study is based on convenient sampling, as it is not possible to collect a full list of young people with EP and caregivers in Hong Kong due to respect of confidentiality of medical records and personal data. Inclusion criteria are: 1) caregivers of a youth under the age of 30 who has been in Hong Kong secondary school or tertiary education, and who has experienced EP, or has a diagnosis of SMI, in the last three years. 2) caregivers who have offered the care to the student for at least one year. Exclusion criteria are: 1) caregivers who have diagnoses of SMI or developmental disabilities, such as intellectual disabilities, which may present difficulties in comprehending the content of the programme. 2) both caregivers and youth who refuse to receive regular psychiatric consultation. The research project will be announced and promoted in all psychiatric units of the Hospital Authority, psychiatrists in private practice, local school social work and youth mental health services, and student counseling services in all tertiary education institutions through emails, and postage of

project leaflets. Six NGOs have indicated their intentions to participate in this study by assisting in promotion, recruitment, programme implementation and data collection. Support letters of these NGO collaborators have been provided in the appendix. As a whole, all collaborators are accounted for the operation of 30% of the Integrated Community Centres for Mental Wellness, and 20% of the school social work service in Hong Kong. Their involvement in project promotion and recruitment can increase the number of caregivers to participate in this project. Based on a recent study, the number of youth meeting the criteria of EP was about 600 per year (Tang et al., 2010), the target of sample size will be met if one of eight caregivers of EP apply for the study programme. All interested caregivers will be invited to participate a briefing session, to explain the rationale and procedures of the study. Social workers from the NGO collaborators will provide standard care to the selected youth, and encourage them to participate the study. However, they will not be involved in data collection and will be fully blinded to the randomization process. A research assistant also blinded to the personal data of the participants, will administer the random assignment using computer generated programming. Participants will be randomly assigned to MBFPE (Arm 1), or ordinary FPE (Arm 2). At the same time, both arms are called “Family Psychoeducation Programme”, and the term “mindfulness” will not be used for Arm 1 to minimize the potential placebo effect. Cash remuneration coupons will be provided to caregivers and youth with EP who can complete the study at T2 and T3.

Procedures

Programme planning and training. The themes and content of arms 1 and 2 are summarized in Appendix 1. There are based on best practices in family work for SMI (Froggatt *et al.*, 2007; McNab & Linszen, 2009). Both programmes include understanding EP, medication, treatment management, mental health service collaboration, attention to caregiver’s experiences and distress, strategies for improving communication and problem-solving, and crisis planning. An internal grant has been approved for producing a video that covers above key topics, and a teacher in psychiatric nursing and senior occupational therapist will assist PI in designing the video. The video shows will be supplemented by discussion with participants. Protocols have developed, and have been refined based on the feedback from instructors, participants, and NGO social workers in pilot study. Instructors for Arm 1 require basic professional training in mindfulness-based intervention, plus at least two-year experiences in conducting mindfulness-based programmes. Instructors for Arm 2 will be recruited from NGO with experiences in working with caregivers for more than two years.

Implementation and assessment. After the first assessment (T1), caregivers who meet inclusion criteria will be randomized into a MBFPE (Arm 1) or an ordinary FPE (Arm 2). After the intervention, participants in both arms will complete the second assessment of the study (T2). For Arm 1, one-hour mindfulness training is infused with one-hour psychoeducation. For Arm 2, the entire session is reserved for information given, problem-solving and mutual support. Both arms involve six sessions, with a total contact time of 12 hours. Both programmes include ten-minute daily homework practice, with Arm 1 being guided with mindfulness exercises, and Arm 2 with stress management talks. Both arms are delivered in group format, with 12 to 18 caregivers in each group. Programmes will be conducted in the service units of NGO collaborators at Wanchai, Wong Tai Sin, and Tsim Sha Tsui, and other convenient locations for participants. A 9-month follow up (T3) is offered as a booster and final assessment for arms 1 and 2. To ensure intervention fidelity, all programme sessions will be audio-recorded and an independent rater will listen to 20% of the selected clips on random basis, and assess whether each element in the intervention protocol has been implemented with consistency. Higher concordance rates will signify greater fidelity to the intervention protocol, which will be carefully monitored throughout the study. The treatment fidelity of Arm 1 will be further assessed by Mindfulness-based Interventions-Teaching Assessment Criteria Scale (Crane et al., 2013).

Embedded mixed methods design. The embedded mixed methods design used examines programme outcomes through experimental design, explore the process of the intervention through qualitative study method *Photovoice*. Based on the previous literature review, there are some queries about the overall caregiving process, and its effects to recovery of student with EF. The quantitative data will be used to investigate the ‘outcomes’ of the MBFPE, and to test if MBFPE can attain positive changes for family caregivers and the youth with EP. A

supplementary, qualitative, participatory action research (PAR) method called *Photovoice*, will be adopted to engage participants to contribute to the more candid and in-depth knowledge of the caregiving process, and to explore the ‘processes’ occurring during MBFPE and the follow-up period (Wang, 1999). In the qualitative study, caregivers will contribute to offering a unique contextual understanding of the outcomes, and for discovering ideas, insights, suggestions, questions, and outcomes that have not been adequately addressed by previous literature. This also offsets the threats of internal validity of the intervention (Bryman, 2006).

Photovoice, as qualitative method technique, can facilitate people to record and reflect about their strengths and concerns of being a caregiver, to foster dialogue about caregiving process and personal experiences in MBPFE, by sharing ideas and discussions of their photos (Ho, Rochelle & Yuen, 2011; Wang, 1999). These procedures include: 1) in MBFPE sessions 2 to 5, themes of *Photovoice* are included as homework assignments; 2) guidelines will be offered at the end of the sessions and participants will be encouraged to take pictures using their smartphones; 3) participants can write down their reflections on the images and share them in the following sessions, and send their pictures and reflections to the research team; 4) in the subsequent session, a time for collaborative enquiry on the pictures and reflections is included. With the consent of the participants, pictures, reflections, content of the in-session enquiries will be displayed. All participants will be involved so as to share and comment on the pictures and reflections about both mindfulness and caregiving. 5) At T3, all pictures will be re-displayed and participants will be invited to view their pictures, to share additional reflections about their experience of caregiving and participation in MBFPE, and highlight their reflections about MBPFE and caregiving from their own experiences.

An Ethical approval for this study has been obtained from the Research Office of the Hong Kong Polytechnic University (ref: HSEARS20161122002).

Measures

All measures of the variables are summarized in Table 1 below. In line with the study objectives and hypotheses, primary outcome variables include caregiver stress, and student psychiatric symptoms. Secondary outcome measures include caregiver’s experiences, depressive symptoms, overall well-being, interpersonal mindfulness, family functioning, and non-attachment for the caregivers, level of recovery of the students with EP, their perceived family EE, and behavioural indicators will be assessed.

Table 1. Outcome variables and measures

Study variables and measures	Sources of data	Validation in HK samples
<i>Primary outcome variables</i>		
Caregiver’s general stress level - Measured by <i>Zarit Burden Interview</i> (ZBI) (22 items) (Zarit, Reever & Bach-Peterson, 1980). The total score ranges from 0 (low burden) to 88 (high burden).	caregivers	$\alpha = 0.84$ (Tang et al., 2016)
<i>Secondary outcome variables</i>		
Caregiving experiences - Measured by <i>Experience of Caregiving Inventory</i> (Szmukler et al., 1996), with selected subscales of stigma (5 items), effects on the family (7 items), positive experience in caregiving (14 items). The Stigma score ranges from 0 (little experience of stigma) to 20 (much experience of stigma). The Effects on the Family score ranges from 0 (little negative effects on the family) to 28 (much negative effects on the family). The Positive Experience in Caregiving score ranges from 0 (little positive experience in caregiving) to 56 (much positive experience in caregiving).	caregivers	$\alpha = 0.74$ to 0.91 (Lau & Pang, 2007)

Caregiver's physical health and mental health - physical health measured by 14 item, physical distress subscale in <i>Body-Mind-Spirit Well-Being Inventory</i> (Ng et al., 2005); anxiety and depression measured by <i>Hospital Anxiety and Depression Scale</i> (Zigmond & Snaith, 1983). The Physical Distress score ranges from 0 (low distress) to 140 (high distress). The Anxiety score ranges from 0 (low anxiety) to 21 (high anxiety). The Depression score ranges from 0 (low depression) to 21 (high depression).	caregivers	$\alpha = 0.87$ (Ng et al., 2005) $\alpha = 0.77$ to 0.82 (Leung et al., 1999)
Caregiver's well-being - measured by <i>WHO-5 Well-Being Index</i> (Johansen, 1998). The total score ranges from 0 (bad well-being) to 25 (good well-being).	caregivers	$\alpha = 0.86$ (Kong et al., 2016)
Caregiver's perceived family functioning - Measured by 5 item, <i>Family APGAR Scale</i> (Smilkstein, Ashworth, & Montano, 1982), with five subscales in adaptation, partnership, growth, affection, and resolve. The total score ranges from 0 (dissatisfaction) to 10 (good satisfaction).	caregivers	$\alpha = 0.94$ (Nan et al., 2013)
Youth's recovery - Measured by <i>Mental Health Recovery Measure</i> (Young & Bullock, 2005), with 30 items in eight subscales relating to positive dimensions in recovery including Overcoming Stuckness (OS; 4 items), Self-Empowerment (SE; 4 items), Learning and Self-Redefinition (LSR; 4 items), Basic Functioning (BF; 4 items), Overall Well-Being (OWB; 4 items), New Potentials (NP; 4 items), Advocacy/Enrichment (A/E; 4 items) and Spirituality (2 items). The total score ranges from 0 (bad recovery-related experiences) to 120 (good recovery-related experiences). OS, SE, LSR, BF, OWB, NP and A/E range from 0 (bad recovery-related experiences) to 16 (good recovery-related experiences). Spirituality ranges from 0 (bad recovery-related experiences) to 8 (good recovery-related experiences). Eight subscale scores are summed to compute a total score.	students	$\alpha = 0.96$ (Ye et al., 2013)
Caregiver's interpersonal mindfulness - measured by the <i>Interpersonal mindfulness in Parenting Scale</i> (Duncan, 2007), with 23 items in four factors in Compassion for Child (CC), Emotional Awareness in Parenting (EAP), Nonjudgmental Acceptance in Parenting (NAP) and Listening with Full Awareness (LFA) (Lo et al., 2018). The total score ranges from 23 (low mindfulness) to 115 (high mindfulness). CC ranges from 7 (low compassion for child) to 35 (high compassion for child). EAP ranges from 6 (low emotional awareness in parenting) to 30 (high emotional awareness in parenting). NAP ranges from 6 (low nonjudgmental acceptance in parenting) to 30 (high nonjudgmental acceptance in parenting). LFA ranges from 4 (less likely listening with full awareness) to 20 (more likely listening with full awareness). Four subscale scores are summed to compute a total score.	caregivers	$\alpha = 0.70$ to 0.84 (Lo et al., 2018)

Caregiver's non-attachment - Measured by short form (8 item) of <i>Non-attachment Scale</i> (Sahdra, Shaver & Brown, 2010). The total score ranges from 8 (low level of nonattachment) to 48 (high level of nonattachment).	caregivers	$\alpha = 0.90$ (Mak, under review)
Youth's family expressed emotions - Measured by 12 item <i>Level of Expressed Emotion Scale</i> (Cole & Kazarian, 1988), with subscales in Criticism (4 items), Hostility (4 items) and Over-Involvement (4 items). Criticism, Hostility and Over-Involvement scores range from 4 (low perceived expressed emotions from particular sources) to 16 (high perceived expressed emotions from particular sources). Three subscale scores are summed to compute a total score.	students	$\alpha = 0.75$ to 0.77 (Ng & Sun, 2011)
Youth's psychiatric symptoms - Assessed by the <i>Positive and Negative Syndrome Scale</i> (PNSS) (Kay, Fiszbein & Opler, 1988). Positive Scale ranges from 7 (few positive syndromes) to 49 (many positive syndromes). Negative Scale ranges from 7 (few negative syndromes) to 49 (many negative syndromes). General Psychopathology Scale ranges from 16 (few general psychopathological symptoms) to 112 (many). - An independent research assistant who has at least 3-year related practice experience will score on positive and negative symptoms, and general psychopathology.	students	$\alpha = 0.73$ to 0.83 (Chen <i>et al.</i> , 2005)

Data Analyses

Quantitative data analyses: Baseline equivalence. The values of the selected primary outcome measures (PSS and PCSS) at T1, will be compared among participants in the two trial arms. The outcomes at T1 and the treatment-condition variable will be used as the dependent variables. *Intervention effects.* All analyses will be carried out according to the intention-to-treat approach. Missing values of participants will be imputed using the last-observation-carried-forward method (Moher et al., 2010). MANOVA will be used to evaluate the effects of the MBFPE (Arm 1), relative to FPE (Arm 2), and the analyses of the primary and secondary outcome measures, including PSS, PCSS, PNSS, and secondary outcome measures will be analyzed. In addition to the immediate programme effects, outcomes measured at T2 and T3 will be compared, to assess whether maintenance effects will be sustained at 12-months.

Qualitative data analyses: The PI and the research team will use grounded theory to analyse the *Photovoice* images, participant's reflections, and MBFPE transcripts (Padgett, 2008). Conceptual categories arise through interpretations of data. The process described encourages the research team to be reflexive about the prior interpretive frames, interests and research context, relationships with participants, and modes of generating and recording empirical materials in the process of analyses (Charmaz, 2006). The team will watch the videotapes of the MBFPE sessions, and study transcripts of themes, categories, and concepts that are generated in inquires of *Photovoice*. The research team will share these reflections to the MBFPE instructors, and invite participants to clarify, elaborate, and critique the interpretations at T3. The simultaneous data collection, construction, and analyses involve constant comparative techniques, by coding the first MBFPE session, then coding the second session, then comparing the coding of these two sessions, then continuing the adding or altering the coding throughout the study. Theoretical sampling will also be undertaken to fill in gaps in the analyses (Belgrave, 2014).

Collaboration with community stakeholders and the democratization of knowledge construction are the strategies for enhancing research credibility for PAR (Balazs & Morello-Frosch, 2013). Data analyses include collaborations with participants, social workers from the NGO collaborators, MBFPE instructors, and the research team. Social workers from the collaborating NGOs have been involved with the team since the pilot study for the formulation

of *Photovoice* procedure. Based on participant's selected pictures, they contribute to the study by sharing their personal reflections in MBFPE. During this process, the most salient features of these dialogues will be jointly determined by the instructor, and MBFPE participants. Transcripts will be recorded and themes will be identified by the researchers. At T3, all pictures and the preliminary analysis will be deliberated with all participants, and concurrence on the coding and interpretations will be reached between researchers and participants. Participants can then comment on the findings of the analyses. Further meetings of research team members, and additional sharing sessions of *Photovoice* for mental health professionals help to strengthen the trustworthiness of the qualitative study findings and culminate the data analysis process.

Project schedule (36 months)

2019

2020

2021

	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
Literature review																																						
Revision of protocol																																						
MBFPE/FPE Group 1 and 2																																						
Recruitment & pretest																																						
Intervention																																						
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Follow-up																																						
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Recruitment & pretest																																						
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Posttest																																						
Follow-up																																						
Data analysis																																						
Report writing																																						

Appendix 1. Proposed Intervention program outline

Content of Mindfulness-Based Family Psychoeducation (MBFPE) (Arm 1) and Family Psychoeducation (FPE) (Arm 2)

Session themes	Mindfulness-Based Family Psycho-Education (MBFBE) (Arm 1)	Family Psycho-Education (FPE) (Arm 2)
Core Process	Non-judgmental, Collaborative inquiry, Self-Care	Information giving, Problem-solving, Mutual support
1. Working with Caregiving Stress	a. Orientation to the program b. Mindfulness Practice: Mindful eating, Body scan c. Discussing the Effects of Caregiver Burden d. Home practice: Body Scan	a. Orientation to the program b. Awareness of stress symptoms, Understanding stress and reactivity in caregiving c. Discussing the Effects of Caregiver Burden
2. The Struggles of a Caregiver	a. Mindfulness Practice: Mindful Stretching b. Inquiry on Practices c. <i>Video show</i> : Challenges in Caregiving and Self-Care d. Home practice: Mindful stretching and <i>Photovoice</i> (A Pleasant Moment)	a. Discussion on Stress, Appraisal and Coping of Caregiving b. <i>Video show</i> : Challenges in Caregiving and Self-Care c. Discussion on Preventing Compassion Fatigue
3. The Struggles of a Person in Recovery	a. Mindfulness Practices: Mindful Sitting, Mindful Walking b. Inquiry on Practices & <i>Photovoice</i> c. <i>Video show</i> : Sharing of Persons in Recovery d. Home practice: Mindful Sitting, Three Minute Breathing, & <i>Photovoice</i> (An Unpleasant Moment)	a. Psychoeducation on Strategies in Working with Positive & Negative Symptoms b. <i>Video show</i> : Sharing of Persons in Recovery c. Discussion on Strategies for Symptom Management and Promoting Recovery

4. The Path of Recovery	<p>a. Mindfulness Practice: Working with Difficult Moments Using Mindfulness</p> <p>b. Inquiry on Practices & <i>Photovoice</i></p> <p>c. <i>Video Show</i> by Psychiatric Nurse & Social Worker: Improve the Effects of Drug Treatment & Multi-Disciplinary Rehabilitation Services</p> <p>d. Home Practice: Working with Difficult Moments Using Mindfulness, & <i>Photovoice</i> (Recovery)</p>	<p>a. Psychoeducation of Recovery Model and Multi-Disciplinary Collaboration</p> <p>b. <i>Video Show</i> by Psychiatric Nurse & Social Worker: Improve the Effects of Drug Treatment & Use of Multi-Disciplinary Rehabilitation Services</p> <p>c. Discussion on Improving Communication with People in Recovery and Mental Health Professionals</p>
5. A Supportive Caregiving	<p>a. Mindfulness Practice: Be-friending Exercise, Mindful Communication</p> <p>b. Inquiry on Homework Practice & <i>Photovoice</i></p> <p>c. Identifying Early Signs of Relapses and Crisis Management</p> <p>c. Home practice: Be-friending & <i>Photovoice</i> (Family & Care)</p>	<p>a. Understanding Communication Skills in Caregiving: Skills Training & Role Plays</p> <p>b. Identifying Early Signs of Relapses and Crises Management</p> <p>c. Understanding Helpful Community Resources</p>
6. Review of Learning	<p>a. Review on Mindfulness Practice: Body Scan, Mindful Sitting, & Befriending</p> <p>b. Inquiry on <i>Photovoice</i></p> <p>c. Review of programme and personal learning</p>	<p>Review of programme and personal learning</p>
9-month booster	<p>Review of changes and benefits in mindfulness</p> <p>Inquiry on <i>Photovoice</i></p>	<p>Review of changes and benefits of the programme</p>

Note: Grey content indicates those areas are unique in specific program

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